UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

mk

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/984,099	12/03/97	MCBRIDE K	CGNE-115-1-U

HM12/0323

CARL J. SCHWEDLER
CALGENE, INC.
1920 FIFTH STREET
DAVIS CA 95616

EXAMINER	
CAMPELL, B	

ART UNIT	PAPER NUMBER
1632	4

DATE MAILED: 03/23/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.	Applicant(s)
8/984,099	McBride et al
Examiner: Campell	Group Art Unit: 1632

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 1-27 is/are pending in the application.

Of the above claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☑ Claim(s) 1-27 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 11 9(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received: _____.

Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☑ Notice of Reference(s) Cited, PTO-892

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Interview Summary, PTO-413

☐ Notice of Informal Patent Application, PTO-152

☑ Other Notice re sequence rules

Office Action Summary

The application was filed with no claim 12 or 24. The claims have been renumbered in accordance with 37 CFR 1.75(f).

Specification

The specification is objected to because it does not include a brief description of the drawings for Figures 7-13.

This application contains sequence disclosures that are encompassed by the definitions for nucleotide and/or amino acid sequences set forth in 37 CFR 1.821(a)(1) and (a)(2). However, this application fails to comply with the requirements of 37 CFR 1.821 through 1.825 for the reason(s) set forth on the attached Notice To Comply With Requirements For Patent Applications Containing Nucleotide Sequence And/Or Amino Acid Sequence Disclosures.

Applicants must comply with the sequence rules in order to effect a complete response to this Office action.

The application should be checked for errors, such as "peptid" in claim 3.

Claim Objections

Claims 23-26 are objected to because they do not comply with 37 CFR 1.821(d), which requires that sequences be identified by SEQ ID No. Appropriate correction is required.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-27 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9, 11-26 and 28-37 of copending Application No.

08/480,178. Although the conflicting claims are not identical, they are not patentably distinct from each other because the two sets of claims are drawn to nearly identical compositions and methods which are obvious variants.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicants are referred to the interim guidelines on written description published June 15, 1998 in the Federal Register at Volume 63, Number 114, pp. 32639-32645 (also available at www.uspto.gov).

The claims are drawn to DNA sequences comprising any "4-4" or "rac" promoter sequence. However, the specification only discloses 4-4 and rac sequences isolated from cotton. In analyzing whether the written description requirement is met for genus claims, it is first determined whether a representative number of species have been described by their complete structure. In this case, the sequences provided in Figures 2 and 5 are the only species whose complete structure is disclosed. Next, then, it is determined whether a representative number of species have been sufficiently described by other relevant identifying characteristics (i.e. other than nucleotide sequence). In this case, the specification does not even define what a "rac" or "4-4" promoter is, much less provide identifying characteristics of the promoters from other species. In particular, no tomato sequences as claimed in claim 11 are disclosed. This limited information is not deemed sufficient to reasonably convey to one skilled in the art that Applicants were in possession of

promoters besides those shown in Figures 2 and 5 at the time the application was filed. Thus it is concluded that the written description requirement is not satisfied for the claimed genus.

Claims 1-13 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for SEQ ID Nos. 2 and 5, does not reasonably provide enablement for all "rac" and "4-4" promoters. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

As noted below in the rejection under § 112, second paragraph, it is not clear what is encompassed by the claims. Applicants may intend to claim only SEQ ID Nos. 2 and 5, but potentially hundreds or thousands of other promoter sequences are encompassed by the claims. For example, the rac coding sequences are similar to sequences found in animals. Do the claims encompass animal rac sequences? The specification also indicates that the disclosed rac sequence is closely related to a Rho1 cDNA from pea. Does this mean that Rho1 is a rac gene? If these other promoters are intended to be encompassed by the claims, the specification has not taught how to use them. The specification is directed to modification of cotton fiber phenotype. Based on the disclosure, there is no reason to believe that animal rac or pea Rho1 promoters would be useful for this purpose. Similarly, the specification provides no indication that other plants (or even animals) possess 4-4 genes, let alone that the corresponding promoters would direct tissue-specific gene expression in cotton fibers. With regard to claim 11, the specification does not disclose in what tissues a tomato rac or 4-4 promoter would be expressed.

The specification does not adequately teach how to make the claimed promoters, other than SEQ ID Nos. 2 and 5. One might define a rac or 4-4 promoter as a promoter which directs cotton fiber-specific gene expression. If this functional definition is used, then the specification does not disclose what portions of the promoter sequences provide this function. Thus if one skilled in the art wished to construct a 4-4 promoter "from scratch" he would not know what sequences to include. The specification alleges that other promoter sequences can be isolated by hybridization (p. 26). However, hybridization conditions are not specified. Under low stringency conditions, many unrelated sequences will hybridize. It also is not clear

what was used as the probe - the promoter sequence itself, the cDNA, the entire genomic sequence? The specification indicates that 7 additional clones were isolated, but does not state from what species they were isolated. The specification does not indicate whether Applicants were isolating promoters from different species, or simply isolating additional clones from the same cotton library.

For the reasons discussed above, the specification does not adequately teach how to make and use all of the promoter sequences potentially encompassed by the claims. This is particularly true given the breadth of the claims, the nature of the invention, the scarcity of guidance in the specification and the unpredictable nature of the art.

Claim 27 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specification does not teach how to use a protein involved in synthesis of a plant hormone to produce a pigment. There is no working example, and no guidance regarding what protein should be expressed and what pigment would be produced.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-22 and 25-27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically:

Claim 1 is indefinite in its recitation of "the 4-4 and the rac promoter sequences." The specification does not define what is meant by a "4-4 promoter" or a "rac promoter." One skilled in the art might think that this means sequences 5' of the rac or 4-4 coding sequence, but the specification does not define what is considered a "rac" or "4-4" coding sequence. Since the function of the rac and 4-4 coding sequences is not disclosed, one skilled in the art would not know whether another sequence was a rac or 4-4 coding

sequence. Thus the claim and specification fail to clearly set the metes and bounds of the claimed invention. Further adding to the confusion, there is already a bacterial promoter designated "rac."

Claim 6 is indefinite in its recitation of "said pigment," which lacks antecedent basis.

Claim 11 is indefinite and confusing because it is not clear how a promoter can be both a 4-4 and a rac promoter.

Claim 14 is indefinite in its recitation of "said plant tissue," which lacks antecedent basis.

Claim 15 is indefinite and confusing because a method can not comprise a DNA sequence.

Claims 17 and 18 are indefinite in their recitation of "components i) through iv)," which lacks antecedent basis.

Claim 22 is confusing in its recitation of "plant tissue is a cotton burr." "Said plant tissue" or "the plant tissue" is suggested.

Claims 25 and 26 are indefinite in their recitation of "An isolated...sequence" since in each case only one sequence is disclosed.

Claim 27 is vague and indefinite in its recitation of "involved in the synthesis of a plant hormone." It is not clear how "involved" a protein must be to be encompassed by the claim. Since cells must be living to produce plant hormones, one might consider any protein required to keep cells alive to be involved in synthesis of the hormone.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-18 and 20-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Benfey et al. in view of John, Mol et al., Hart et al., Deeley et al., Klein et al., Vandekerckhove et al. and Link. Benfey et al. disclose a method for altering the color of flower petals by expressing an anthocyanin synthesis gene under control of a petal-specific promoter (pp. 853-855). It is not clear whether the DNA construct of Benfey et al. contained a sequence encoding a transport signal. Benfey et al. do not disclose a method for altering the color of cotton fibers. John discloses several promoter sequences which cause transcription in cotton fibers. John teaches that alteration of cotton fiber quality is one of the most important benefits to be achieved from genetically engineering cotton (col. 2). Mol et al. suggest producing blue flowers by expression of bacterial genes encoding indigo synthesis (p. 292, col. 2). Hart et al. teach that the *pig* gene of *Rhodococcus* produces indigo from indole, which is synthesized from tryptophan (entire document). Deeley et al. disclose the sequence of the *E. coli* tryptophanase gene, *tna*. Klein et al. teach that the R and C1 genes control anthocyanin synthesis. Vandekerckhove et al. teach that a signal sequence is required for transport of an elongating peptide chain into the endoplasmic reticulum (col. 3, lines 17-21) and disclose a signal sequence for this purpose (col. 18, lines 61-63). Link teaches that there is a high demand for cotton which is colored "naturally," i.e. without the use of dye, but that traditional breeding methods do not consistently produce the color and fiber quality desired (entire document).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Benfey et al. by using a cotton fiber-specific promoter of John to express pigment synthesis genes as taught by Mol et al., Hart et al. and Deeley et al., or Klein et al. It would have been obvious to use the signal sequence of Vandekerckhove et al. to target the expressed proteins to the endoplasmic reticulum. It would have been obvious to use the *pig* gene of Hart et al., since it was shown to produce indigo when transferred into a different organism, and it would have been obvious to co-express the *tna* gene of Deeley et al. to increase the supply of substrate for indigo synthesis. It would have been equally obvious to use the maize anthocyanin synthesis genes taught by Klein et al. There would have been a reasonable expectation of success, since plant and bacterial genes are routinely expressed in plant

tissues, and given the demonstrated success of Benfey et al. in altering flower petal color. The skilled artisan would have been motivated to produce naturally colored cotton, given the recognized demand for such a product and the premium price obtainable in the marketplace, as discussed by Link. Thus, the invention as a whole was clearly *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

Claims 1-13 and 23-26 are free of the prior art because the prior art does not teach or suggest "rac" or "4-4" promoter sequences or SEQ ID Nos. 1, 2, 4 and 5. Claim 19 is free of the prior art because the prior art does not teach or suggest synthesis of melanin in plant tissues. Claim 27 is free of the prior art because the prior art does not teach or suggest the use of hormone synthesis genes to synthesize a pigment.

Conclusion

No claim is allowed. However, claims 23 and 24 would be allowable if they complied with the sequence rules.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bruce Campell, whose telephone number is 703-308-4205. The examiner can normally be reached on Monday-Thursday from 8:00 to 4:30 (Eastern time). The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Stanton, can be reached on 703-308-2801. The FAX phone numbers for group 1600 are 703-308-4242 and 703-305-3014.

An inquiry of a general nature or relating to the status of the application should be directed to the group receptionist whose telephone number is 703-308-0196.

BRUCE R. CAMPELL
PRIMARY EXAMINER
GROUP 1600

Application No.: 8/984,099

NOTICE TO COMPLY WITH REQUIREMENTS FOR PATENT APPLICATIONS CONTAINING NUCLEOTIDE SEQUENCE AND/OR AMINO ACID SEQUENCE DISCLOSURES

The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 C.F.R. 1.821 - 1.825 for the following reason(s):

☒ 1. This application clearly fails to comply with the requirements of 37 C.F.R. 1.821-1.825. Applicant's attention is directed to these regulations, published at 1114 OG 29, May 15, 1990 and at 55 FR 18230, May 1, 1990.

☐ 2. This application does not contain, as a separate part of the disclosure on paper copy, a "Sequence Listing" as required by 37 C.F.R. 1.821(c).

☐ 3. A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 C.F.R. 1.821(e).

☐ 4. A copy of the "Sequence Listing" in computer readable form has been submitted. However, the content of the computer readable form does not comply with the requirements of 37 C.F.R. 1.822 and/or 1.823, as indicated on the attached copy of the marked -up "Raw Sequence Listing."

☐ 5. The computer readable form that has been filed with this application has been found to be damaged and/or unreadable as indicated on the attached CRF Diskette Problem Report. A Substitute computer readable form must be submitted as required by 37 C.F.R. 1.825(d).

☐ 6. The paper copy of the "Sequence Listing" is not the same as the computer readable from of the "Sequence Listing" as required by 37 C.F.R. 1.821(e).

☐ 7. Other: _____

Applicant Must Provide:

☒ An initial ~~or substitute~~ computer readable form (CRF) copy of the "Sequence Listing".

☒ An initial ~~or substitute~~ paper copy of the "Sequence Listing", as well as an amendment directing its entry into the specification.

☑ A statement that the content of the paper and computer readable copies are the same and, where applicable, include no new matter, as required by 37 C.F.R. 1.821(e) or 1.821(f) or 1.821(g) or 1.825(b) or 1.825(d).

For questions regarding compliance to these requirements, please contact:

For Rules Interpretation, call (703) 308-4216
For CRF Submission Help, call (703) 308-4212
For PatentIn software help, call (703) 308-6856

PLEASE RETURN A COPY OF THIS NOTICE WITH YOUR RESPONSE